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(54) FLUSHING FLUID SEPARATOR FOR USE IN
EROSION DRILLING OF WELLS

The invention relates to the drilling of wells with cleaning of the flushing fluid at the wellhead.

A device is known for separating solid phase fractions of the flushing fluid with the aid of centrifugal forces, which consists of a metallic casing, within which is secured a hollow rubber body, a rubber feed nozzle and a metallic discharge nozzle [1].

A disadvantage of this device is the short service life.

Also known is a flushing fluid separator for use in erosion drilling which consists of a body with a nozzle and an orifice connecting the reduced pressure cavity with the string-borehole annulus [2].

A disadvantage of this device is the impossibility of separating fine shot when using the erosion method of drilling.

The object of the invention is to improve the degree of separation of flushing fluid by ensuring trapping of the fine fraction of abrasive when using erosion drilling.

The stated object is achieved in that a flushing fluid separator is fitted with a rotating helical magnet, disposed in a casing, the casing and magnet being made in the form of a cone.

The drawing shows a general view of the separator.

The separator consists of conical casing 2, connected to drill string 1 and mounted on bearings 3, helical conical permanent magnet 4, which has a special (electrical or hydraulic) drive, channel 5, with constriction 6, within the magnet bore 7, orifice 8 and nozzle 9.

The device operates in the following manner.

Abrasive fluid with a charge of abrasive is passed through the drill string via the separator to the hole bottom where, saturated with slag, it is passed upwardly from the hole bottom through the string-borehole annulus.

Having risen to the separator, the ascending stream comes under the influence of the rotating magnetic field. The steel shot, held against the separator casing, continues its movement spirally upwards along the conical casing, where it is suctioned through orifice 8 of casing 2 and bore 7 into the separator due to the ejector effect of the jet of flushing fluid exiting nozzle 9. The conical casing facilitates better separation of the abrasive.

The steel shot is then directed together with the flushing fluid to the hole bottom through the bit, where it further breaks up the rock.

Use of the flushing fluid separator now proposed allows the advantages of the erosion method of breaking down rocks to be implemented to a substantial extent, and the wear of drilling equipment to be reduced by reducing the amount of abrasive entrained from the well.